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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,952	11/05/2001	Uwe Jantsch	5085-17	6769

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EXAMINER	
CHANEY, CAROL DIANE	
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 04/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/992,952	JANTSCH ET AL.	
	Examiner	Art Unit	
	Carol Chaney	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,2 and 4-7* is/are allowed.

6)☒ Claim(s) *3 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "10-20 wt% palladium" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim since applicant has amended claim 1 so that palladium is not recited.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buxbaum, US Patent 6,183,543 B1 in view of Buxbaum, US Patent 5,215,729.

The Buxbaum '543 patent discloses an apparatus for extracting hydrogen from a gas mixture. The apparatus includes hydrogen permeable membrane alloys. Nb-Au (Au 1-10%), Nb-Pt (Pt 1-10%) and Nb-Pd (1-10% Pd) are disclosed alloys. (See column 12, lines 31-51.)

The Buxbaum '543 patent does not disclose a hydrogen permeation membrane using a niobium alloy containing either zirconium of hafnium in addition to Pd, Ru, Re, Pt, Au, or Rh. The Buxbaum '729 patent teaches the niobium alloys Nb 1%Zr and Nb

10%Hf 1%Ti are stronger, or non-hydrogen embrittling, compared with pure niobium. (See '729 patent, column 3, lines 3-6,) Thus, it would have been obvious to one of ordinary skill in the art to use either Nb1%Zr or Nb10%Hf1%Ti rather than pure Nb in the hydrogen permeable membranes disclosed in the Buxbaum '543 invention, in order to have a stronger alloy.

Response to Arguments

Applicant's arguments filed 02 January 2004 have been fully considered but they are not persuasive. Applicants assert the presently claimed invention is only a single layer formed from an alloy homogenized by a diffusion process. Claim 8, however, does not require these limitations, and therefore is not restricted to single layer, homogeneous membranes.

Applicant further asserts "the Ti-based alloy of Buxbaum '729 only possesses small amounts of Nb (10%) and 1% of Hf. This is not comparable to a Nb-based alloy which is understood in the art to have around 95% Nb." However, the hydrogen permeable membrane alloys disclosed in the Buxbaum '729 reference are described as

> **Examples of refractory metals are vanadium tantalum, zirconium, niobium, and their stronger, or non-hydrogen embrittling alloys. Alloys include: Nb 1% Zr, Nb 10Hf 1Ti, Vanstar TM, and V15Cr 5Ti.**

The first alloy listed is an alloy which is about 99% Nb and 1% Zr (See ASM Metals Handbook, Volume2, Refractory Metals and Alloys, Nb-1Zr.) Similarly, the second alloy is 89% Nb, 10% Hf, and 1% Ti. Thus, these alloys are predominately niobium.

Allowable Subject Matter

Claims 1, 2, and 4-7 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: With regards to claims 1 and 2, the nearest prior art of Buxbaum does not suggest a niobium alloy with 5-25 weight percent ruthenium, rhenium or rhodium as a hydrogen permeation membrane. Buxbaum discloses niobium alloys containing 1-10 percent of any of gold, platinum or palladium as alloys for a hydrogen permeable membrane. However, the prior art provides no suggestion or motivation to replace Au, Pt or Pd with Ru, Re, or Rh. It is noted that alloys or niobium and rhodium and niobium and ruthenium are known. (See ASM Handbooks Online, Vol. 3; http://www.asminternational.org/hbk/index.jsp)
However, there is no suggestion from the phase diagrams to use the published alloys as hydrogen permeation membranes.

With regards to claims 4, 5, and 7, it is noted that the term "diffusion heat treatment" is defined by applicants' specification as method where the individual components diffuse into each other and thus are able to form an appropriate homogeneous alloy. (Note applicants' specification page 4, lines 2-4.) Thus, as noted in applicants' response of 02 January 2004 Buxbuam's disclosure of forming the alloys by "specifically contacting a second layer to a first layer..." will not form a homogeneous alloy, as required by applicants' definition of diffusion heat treatment recited.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (571) 272-1284. The examiner can normally be reached on Mon - Fri 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Carol Chaney
Primary Examiner
Art Unit 1745

2 April 2004